Diversions with John Gough

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Book mathematics — Part 1

Editor's note: In this occasional series, John Gough presents the many mathematical possibilities found in books/stories that are not deliberately mathematical in nature.

I would like to think that anyone who enjoys mathematics also enjoys reading (although the converse of this may not be true, alas). I know I do; but this does not necessarily mean that what I read is exclusively mathematical or about mathematics. Indeed it is comparatively rarely that I find myself pausing, while reading, to consider the mathematical implications of some point in a book. Yet when this does happen, it is especially arresting — and potentially the start of some interesting mathematical thinking. Moreover, my enjoyment and understanding of the book is enhanced by this detour into mathematics.

Of course there is more to mathematics than arithmetic (numeracy > numberacy). Consider such aspects of a book as:

- when: time-lines, and historical relationships;
- where: maps, and journeys;
- logical reasoning: cause-and-effect and deductive inference;
- spatial orientation, and geometric attributes;
- family relationships: family trees, time-lines of family history;
- scale and proportion and ratios;
- units of measurement: distance, time, money, mass;
- probability and randomness;

and so on.

Alex Kasman's website, *Mathematical Fiction* (http://math.cofc.edu/kasman/MATHFICT/ (last accessed 21 September 2007)) provides a large list of books that deal with mathematics, mathematicians or scientists (for example, Kasman includes Bertold Brecht's play *The Life of Galileo*), or that have some mathematical term in their title (for example, Kasman includes John Cheever's short story *The Geometry of Love*, although this simply mentions geometry as a hobby of the central character).

Each of the following excerpts from books offers a mathematical challenge. Each of the books is itself worth reading, for different interests or purposes.

I would be glad to have further examples from other keen readers.

Mr Midshipman Hornblower (C. S. Forester, 1950)

In *Chapter Two: A Cargo of Rice* (pp. 51–55), the young midshipman (junior naval officer) has been put in charge of a captured French cargo ship, full of rice. The ship has been damaged in the fight that led to its capture. A cannonball struck the hull, below the water-line, while the ship was heeled over under a full-spread of sail.

> Rice would absorb every drop of water taken in by the ship, so that no leak would be apparent on sounding the well [the bilges]... Dry rice soaked in water would double or treble its volume. The cargo was swelling and bursting the [wooden] seams of the ship open.

This is a thrilling twist to an exciting story, threatening young Hornblower's first independent command; but does dry rice really swell that much? (What about lentils, or dried lima beans?)

There is a great deal of incidental mathematics, or mathematical stimuli throughout the Hornblower books, including frequent use of old British and European units of measurement (quintals of salt and hogsheads of rum, for instance, in *The Happy Return*), and necessary attention to maps, as well as time-lines for Napoleonic history. It should be noted that (like Patrick O'Brien's naval captain Jack Aubrey in a sequence of novels, partly filmed as *Master and Commander* with Russell Crowe) many of

the exploits of Hornblower are actually based on a real-life Napoleonic era naval captain Thomas Cochrane.

The Stinky Cheese Man and Other Fairly Stupid Stories (Jon Scieszka & Lane Smith, 1992)

In the Introduction, Jack, the narrator, is explaining the difference between traditional "fairy tales" and "fairly stupid tales," such as "Goldilocks and the Three Elephants," in which Goldilocks breaks into the home of the three elephants, but is unable to climb into any of the chairs (elephants' chairs, even those for baby elephants, are rather large), and so she goes home. Jack then urges the reader:

> …you should definitely go read the stories now, because the rest of this introduction just kind of goes on and on and doesn't really say anything. I stuck it in here so it would fill up the page and make it look like I really knew what I was talking about. So stop now. I mean it. Quit reading. Turn the page. If you read this last sentence it won't tell you anything.

Think about it. Does that last sentence tell you anything?

This is a very funny, fairly stupid (or brilliant) book (as are all the books by Jon Scieszka and various colleagues, especially *The Maths Curse*, which is arguably the most mathematics-intense picture-story book ever written — and one of the funniest). On the back cover, the egocentric, talkative Little Red Hen asks, "Who is this ISBN guy?" The story that Jack tells (under extreme threats from the Giant) is in the great tradition of the dark and stormy night where a story is called for, so the narrator begins telling a story about a dark and stormy night where a story is called for, so…

Recursion, and self-referential statements are important concepts in mathematics logic. The famous case of Epimenides (6th century BC), the Cretan who declared that all Cretans are liars, was one of the first of these paradoxes. Douglas Hofstadter's classic (non-fiction) *Gödel, Escher, Bach: An Eternal Golden Braid* (1979) explores recursion and other aspects of mathematics in music, logic and art, circling recursively around Kurt Gödel, Maurits Escher, and Johann Sebastian Bach — and, most appropriately, Lewis Carroll (the pen-name for a major nineteenth century mathematician). Raymond Smullyan also explores these fascinating topics: one of his book titles plays on self-reference: *What is the Name of This Book?* Compare this with the name-ambiguity of the Abbott and Costello vaudeville and film routine "Who's on first?" and Odysseus using a nom-de-guerre to boast to the blinded Cyclops that "Noman has hurt you!"

From Helen Prochazka's

SCRAPBOOK

Perhaps the most surprising thing about mathematics is that it is so surprising. The rules which we make up at the beginning seem ordinary and inevitable, but it is impossible to foresee their consequences. These have only been found out by long study, extending over many centuries. Much of our knowledge is due to a comparatively few great mathematicians such as Newton, Euler, Gauss, or Riemann; few careers can have been more satisfying than theirs. They have contributed something to human thought even more lasting than great literature, since it is independent of language. (E. C. Titchmarsh)
In N. Rose, 1988, "Mathematical Maxims and Minims", Raleigh NC: Rome Press.